ELECTRONIC RHYTHM INSTRUMENT

RHYTHM ACE

model FR-2L

SERVICE NOTE

ACE ELECTRONIC INDUSTRIES INC.

RHYTHM ACE FR-2L

MAIN FEATURES

- Rhythm patterns(Rhythm selectors) 16
  - Waltz
  - Dixieland
  - Western
  - Rock'n Roll
  - Slow Rock
  - Bossanova
  - Foxtrot
  - Swing
  - Tango
  - Beguine
  - Rhumba
  - Samba
  - Mambo
  - Cha-Cha
  - Shuffle
  - March
- Percussive Sounds 10
  - Bass Drum
  - Low Conga
  - High Conga
  - High Bongo
  - Cow Bell
  - Claves
  - Snare Drum
  - Cymbal
  - Maracas
  - Wirebrush
- Cancel Button Switch 3
  - Cymbal
  - Claves
  - Snare Drum
- Volume Control Knob with Switch 1
- Tempo Control Knob 1
- Start Push Button Switch 1
- Transistor
  - 2SB171B 25
  - 2SB175B 5
  - 2SC538 8
- Diode
  - SM150SS 107

- Power Source
  - 110/117volts or 220-240volts 50/60 cycles
- Dimension
  - 600 × 300 × 83mm
- Weight
  - 6kg

General Description

The Selector Switch is consisted of 16 push-button switches. All of these switches are rhythm selectors. When any rhythm selector button is depressed, the Rhythm Ace plays the corresponding rhythm. This switch also allows the musician to depress two or more buttons simultaneously to create truly unique rhythms. When the start switch is depressed, the Rhythm Ace is turned on.

The Tempo Control Knob is used to control tempo of the selected rhythm. Tempo is variable from 22 to 75measures per minute.

The FR-2L itself is consisted of three major sections and a power supply. The first major section is the Control Section, which consists of the Rhythm Generator and Selection system. The second major section is the Audio Preamplifier. (Refer:Figure 1.)

How to adjust semi-fixed resistors on print circuit boards (P.C.B.)and lug terminal

*Tempo Speed:

Speed is variable by adjusting VR1 and VR3.

A: Set the tempo speed control knob at 4th marking from Slow side and adjust VR1 so that tempo light brightens 30 times per minute.

B: Set the same knob at 2nd marking from Fast side. and adjust VR3 until light brightens 60. times per minutes.

Repeat same procedures until tempo speed synchronizes with number of measures at 22.24.27.30.35.40.50.60.75.times per minute.(Ref:Fig. 5.6)

*Decay Time:

If the duration of each sound is not satisfactory. the decay time(length of duration)can be adjusted by the following

resistors.

Bass Drum	VR4
Low Conga	VR5
High Conga	VR6
High Bongo	VR7
Cow Bell	VR8,9
Claves	VR10

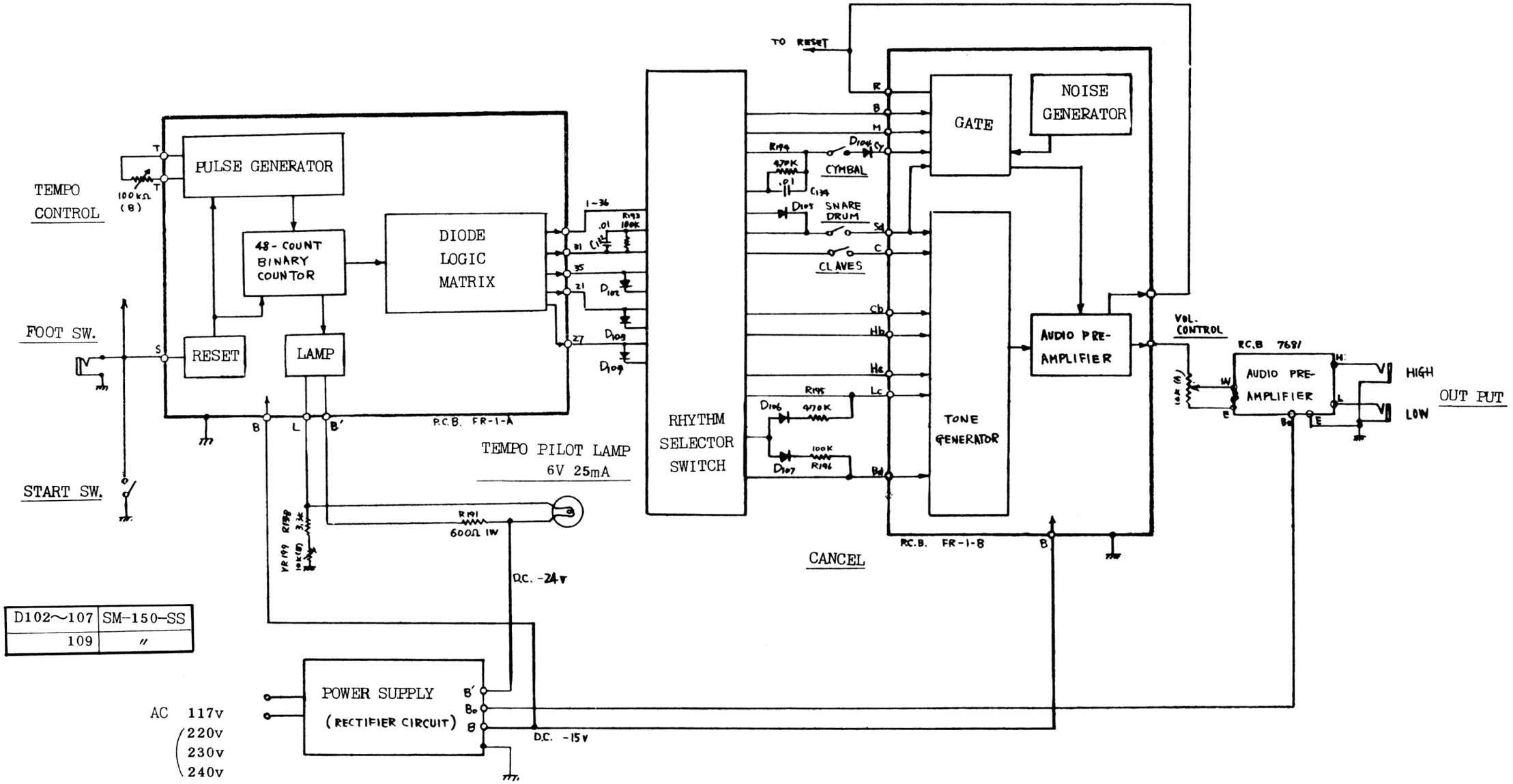
When the sound of Snare Drum,Cymbal,Maracas and Wirebrush is too loud or too small,adjust VR11.

If the sounds of Bass Drum,Low Conga,High Conga,High Bongo, Cow Bell and Claves are louder than the same of Snare Drum, Cymbal,Maracas and Wirebrush or vice versa, slight adjustment is possible by VR138.(Ref. Fig. 2. 3&4)

The brightness of tempo lamp is adjustable by VR199 on the lug terminal located near metal cover for power supply.
(Ref. Fig. 2& 6)

Note:

The manufacturer holds the right of changing such component parts as resistors, condensers and coils for improvement with or without previous notice.



D102~107	SM-150-SS
109	〃

Fig 1 RHYTHM ACE FR-2L
Detailed Block Dia.

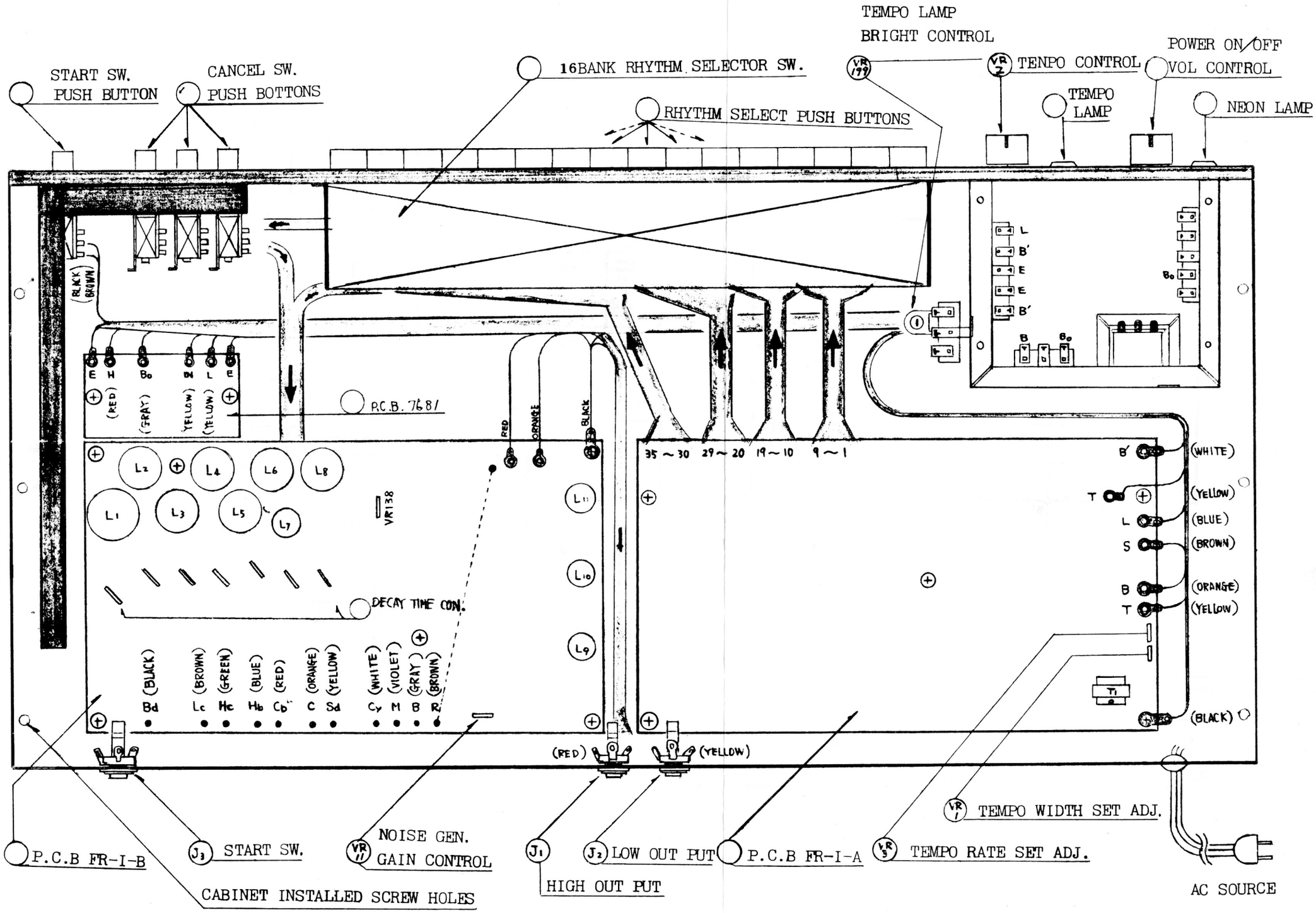
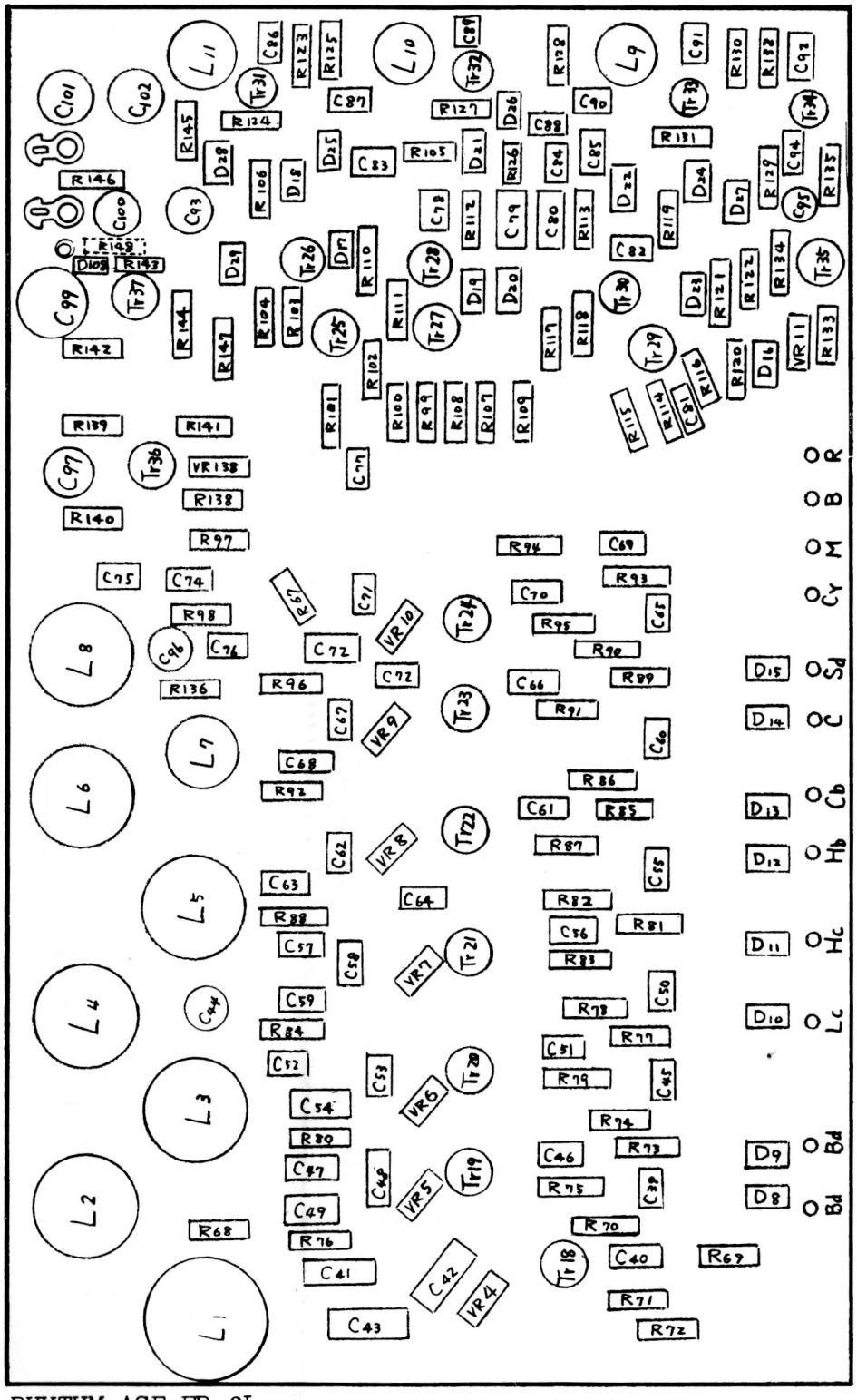

TEMPO LAMP
BRIGHT CONTROL
POWER ON/OFF
START SW.
PUSH BUTTON
CANCEL SW.
PUSH BOTTONS
16BANK RHYTHM SELECTOR SW.
VR 179
VR 2
TENPO CONTROL
VOL CONTROL
TEMPO
LAMP
NEON LAMP
RHYTHM SELECT PUSH BUTTONS
(BLACK)
(BROWN)
E H Bo N L E
(RED)
(GRAY)
(YELLOW)
(YELLOW)
P.C.B. 7681
RED
ORANGE
BLACK
L2 L4 L6 L8
L1 L3 L5 L7
VR138
DECAY TIME CON.
L11
L10
L9
35 ~ 30
29 ~ 20
19 ~ 10
9 ~ 1
L
B'
E
E
B'
B
Bo
Bo
B'
(WHITE)
T
(YELLOW)
L
(BLUE)
S
(BROWN)
B
(ORANGE)
T
(YELLOW)
T1
(BLACK)
(BLACK)
(BROWN)
(GREEN)
(BLUE)
(RED)
(ORANGE)
(YELLOW)
(WHITE)
(VIOLET)
(GRAY)
(BROWN)
Bd
Lc
Hc
Hb
Cb
C
Sd
Cy
M
B
R
(RED)
(YELLOW)
VR 1
TEMPO WIDTH SET ADJ.
P.C.B FR-I-B
J3
START SW.
VR 11
NOISE GEN.
GAIN CONTROL
J1
HIGH OUT PUT
J2
LOW OUT PUT
P.C.B FR-I-A
VR 3
TEMPO RATE SET ADJ.
CABINET INSTALLED SCREW HOLES
AC SOURCE

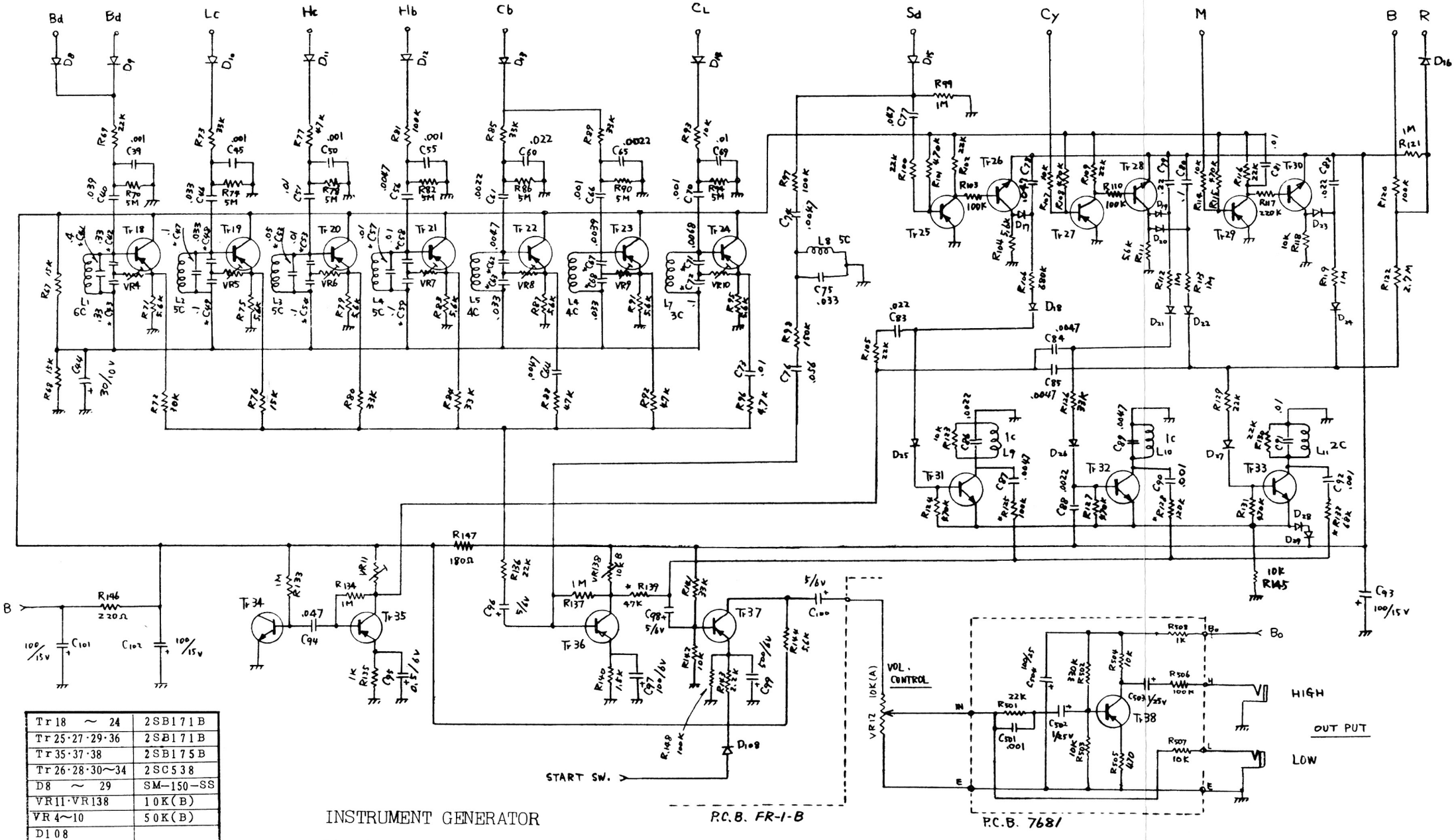
Fig 2



RHYTHM ACE FR-2L

Instrument Generator Assembry(P.C.B.FR-IB) Fig 3

Elements Location Dia.



Tr 18 ～ 24	2SB171B
Tr 25·27·29·36	2SB171B
Tr 35·37·38	2SB175B
Tr 26·28·30～34	2SC538
D8 ～ 29	SM-150-SS
VR11·VR138	10K(B)
VR 4～10	50K(B)
D108	

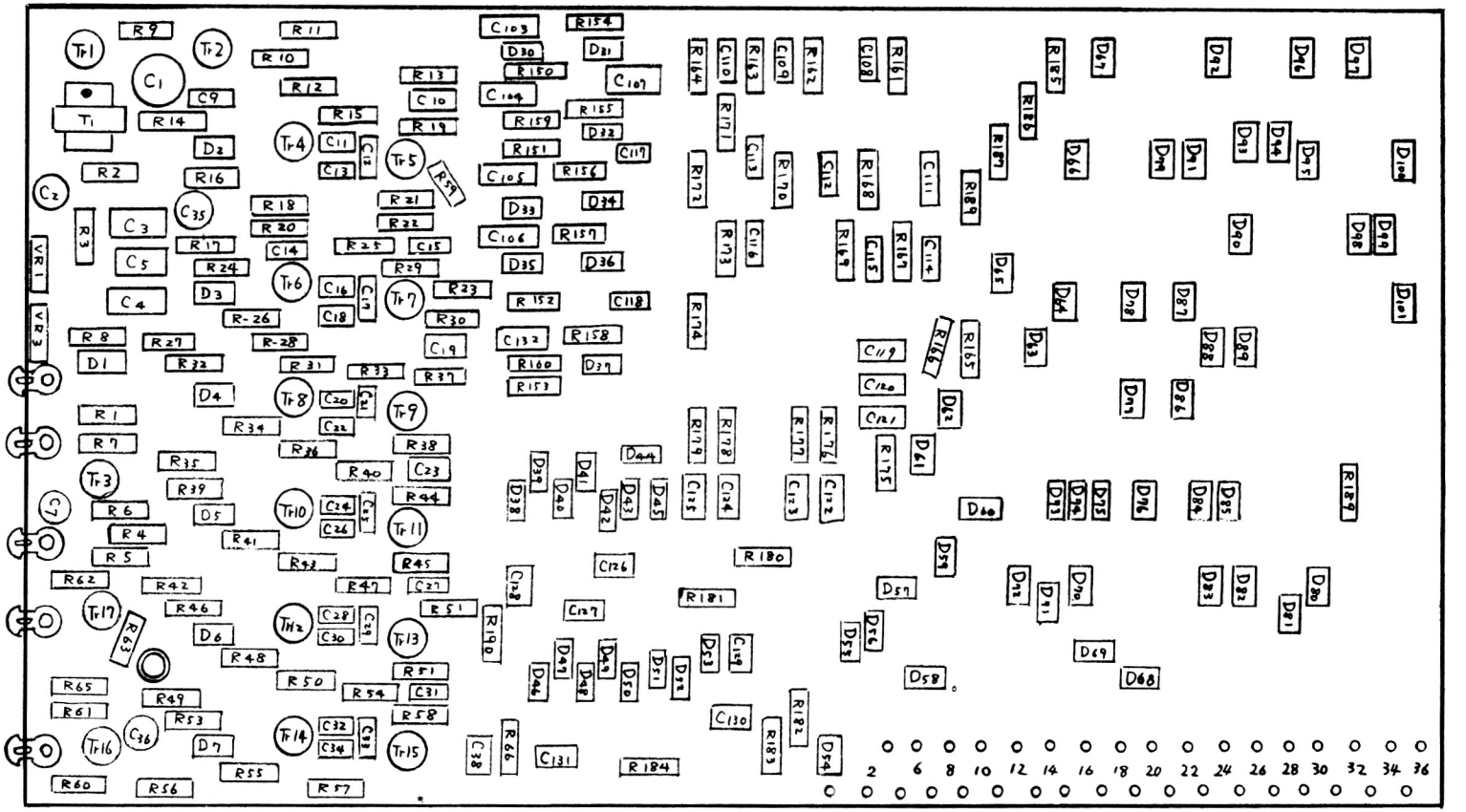
INSTRUMENT GENERATOR

Rhythm Element Dia.

PREAMPLIFIER

Schmatic Dia.

Fig 4



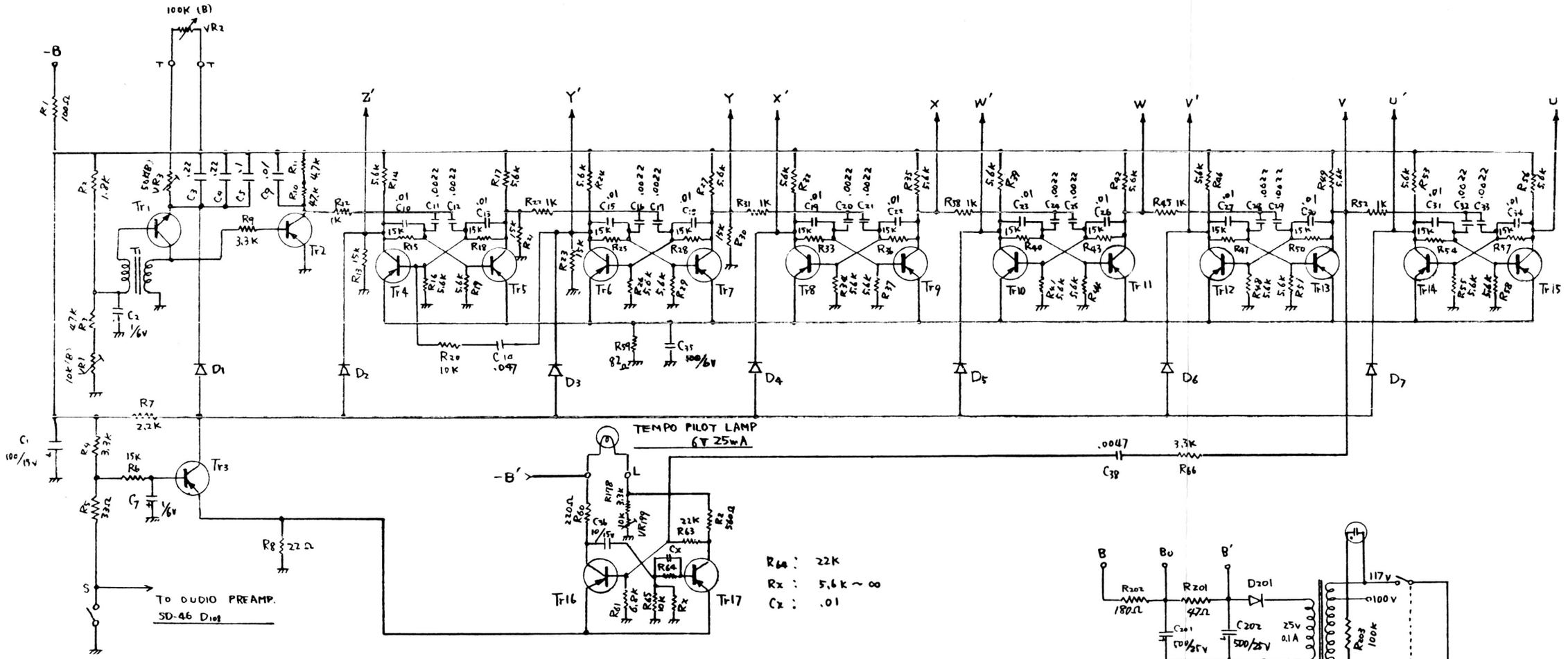
RHYTHM ACE FR-2L

Commutator and Logic Assembry(P.C.B.FR-IA)

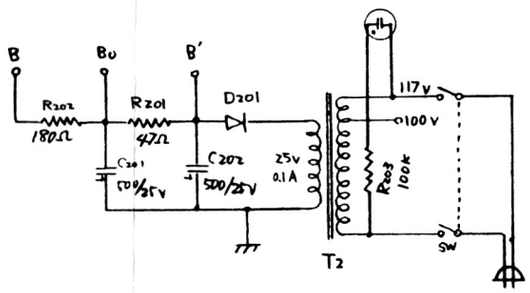
Elements Location Dia.

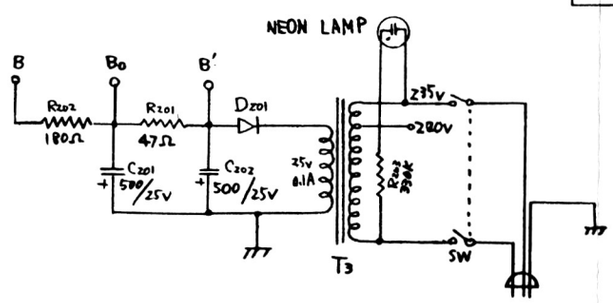
Fig 5

TEMPO CONTROL



START SWITCH





Tr1	2SC538
Tr2 ~ 15	2SB171B
Tr16~17	2SB175B
D1~7.201	SM-150-SS

Fig 6

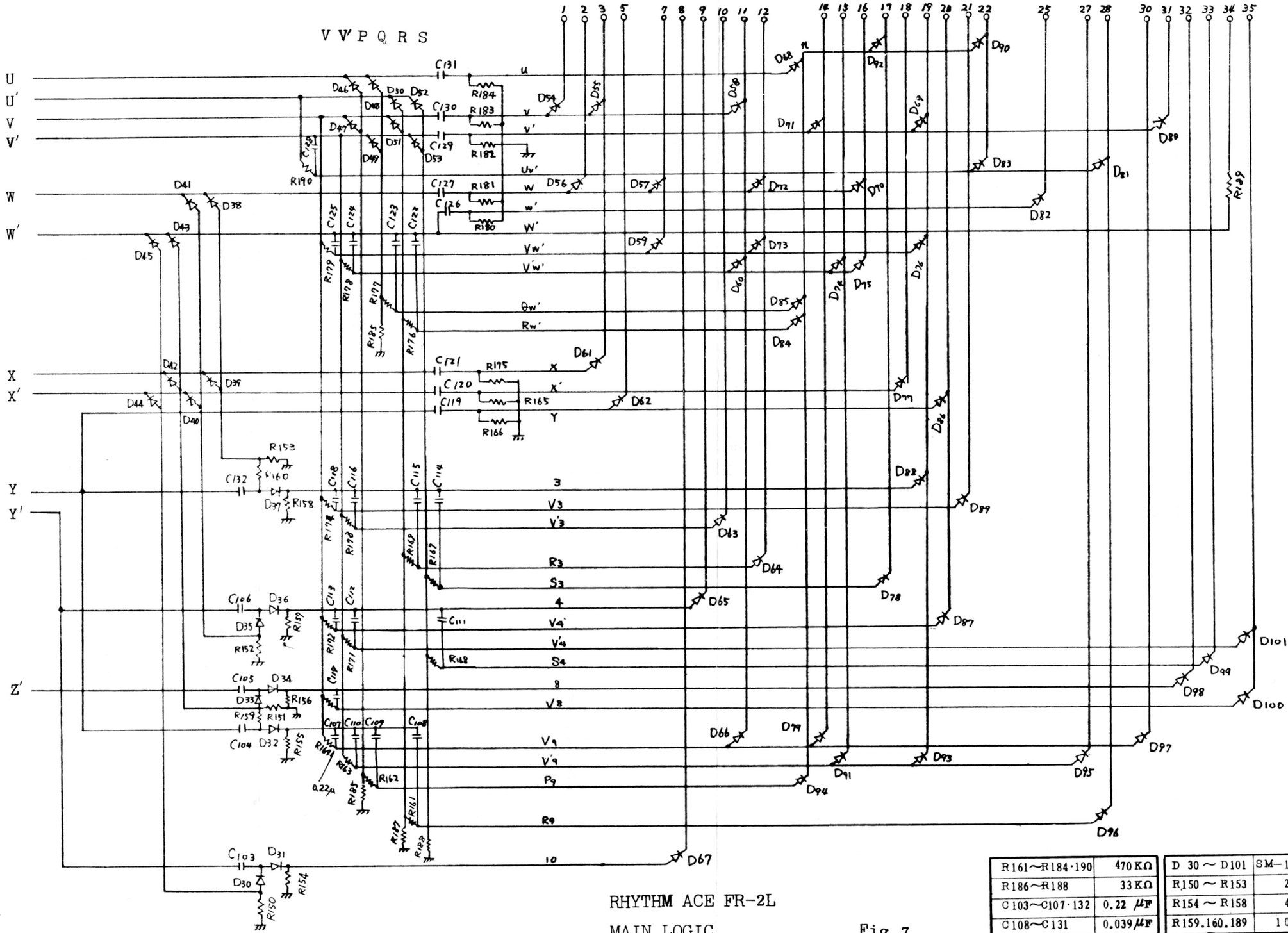
RHYTHM ACE FR-2L

48-Count Binary Countor

Power Supply

Tempo Lamp

Schematic Dia.



R161～R184·190	470KΩ
R186～R188	33KΩ
C103～C107·132	0.22 μF
C108～C131	0.039μF

D 30 ～ D101	SM－150－SS
R150 ～ R153	22KΩ
R154 ～ R158	47KΩ
R159.160.189	100KΩ

RHYTHM ACE FR-2L
MAIN LOGIC
Schematic Dia.

Fig 7

SELECTION SYSTEM

SELECTOR SWITCH LAYOUT

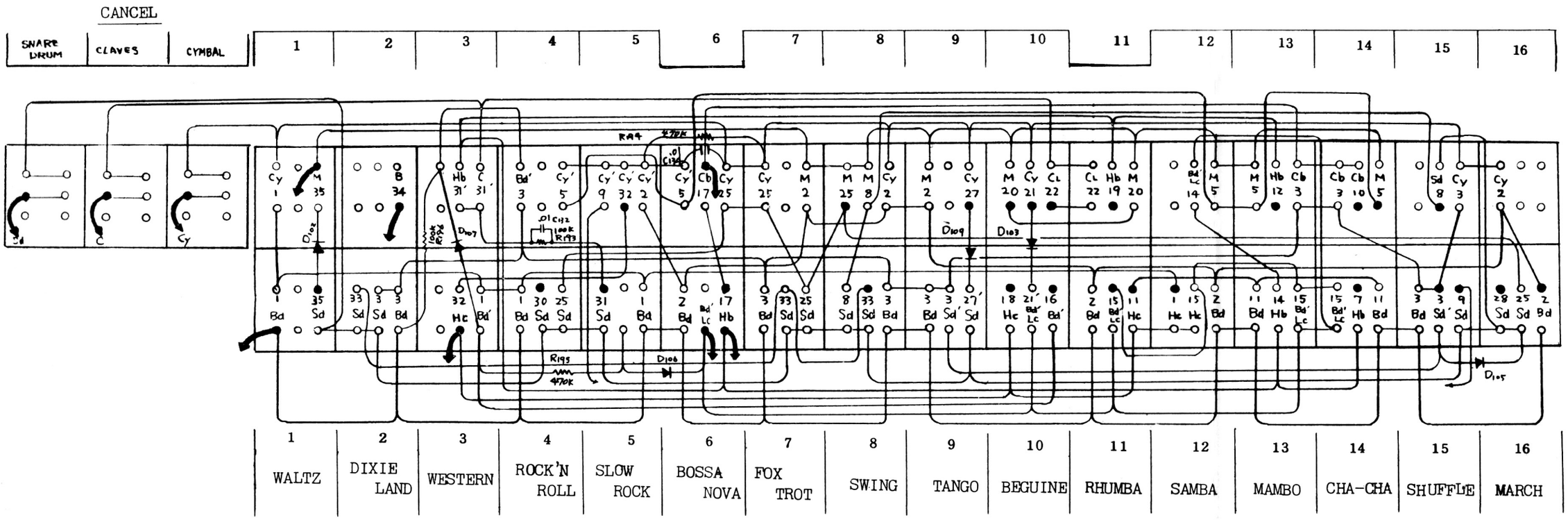
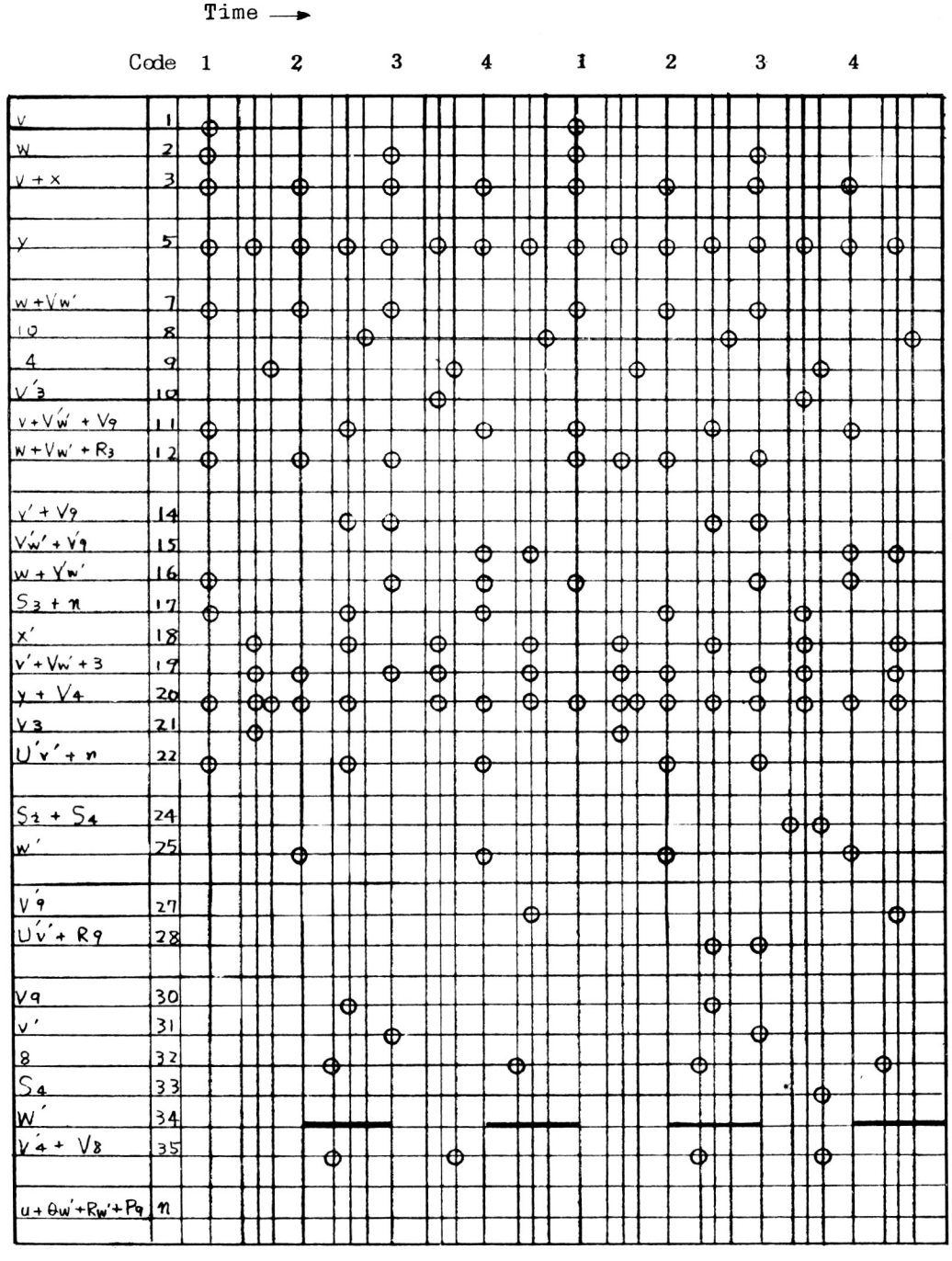


Fig 8



LOGIC OUTPUT TIMING CHART

Figure 9 shows the logic outputs according to their numerical coding(1～35). Output logic is shown as positive pulses occurring at the times indicated. These times are the 48-Count Binary counter cycle time.

Fig 9

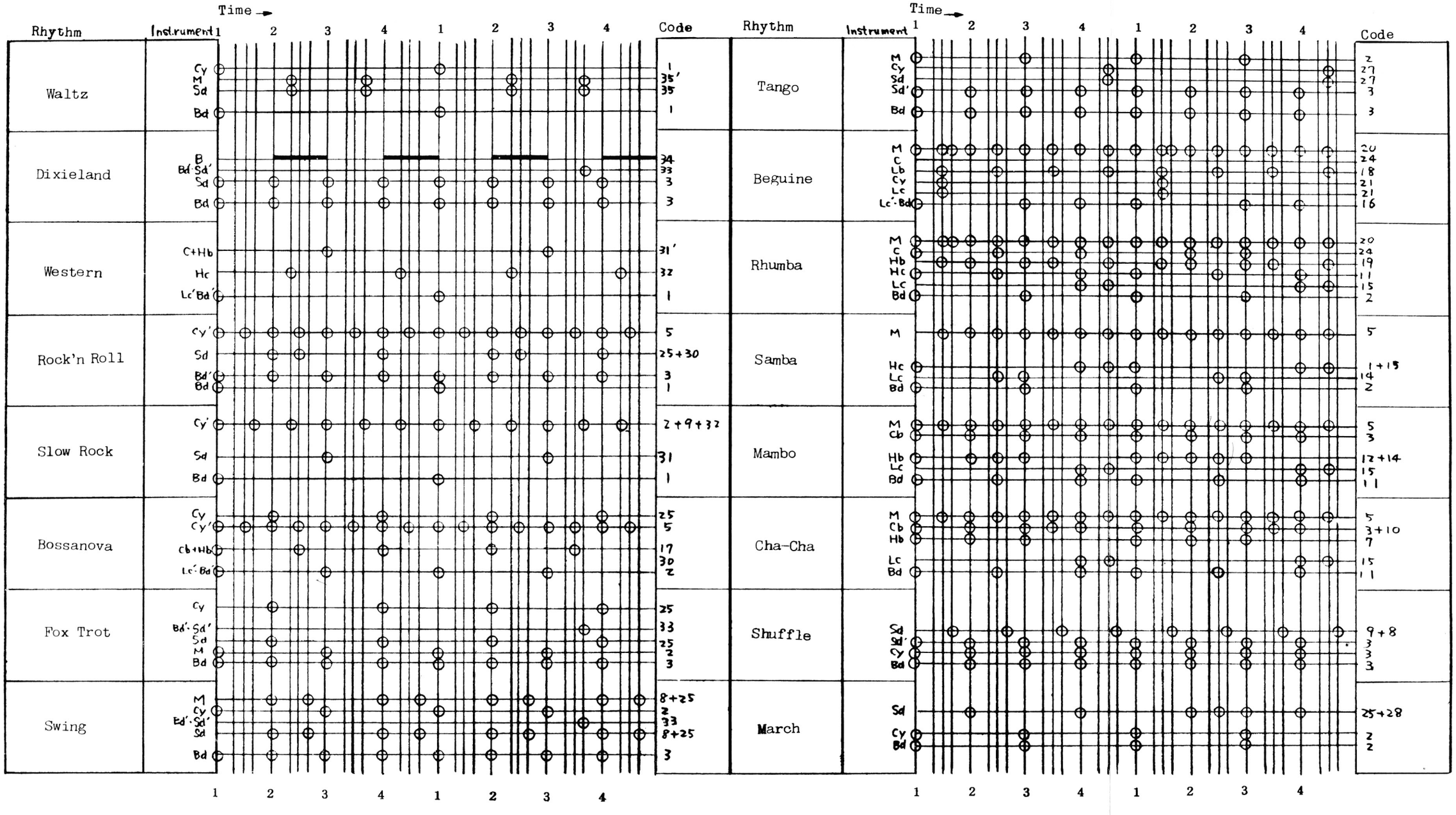
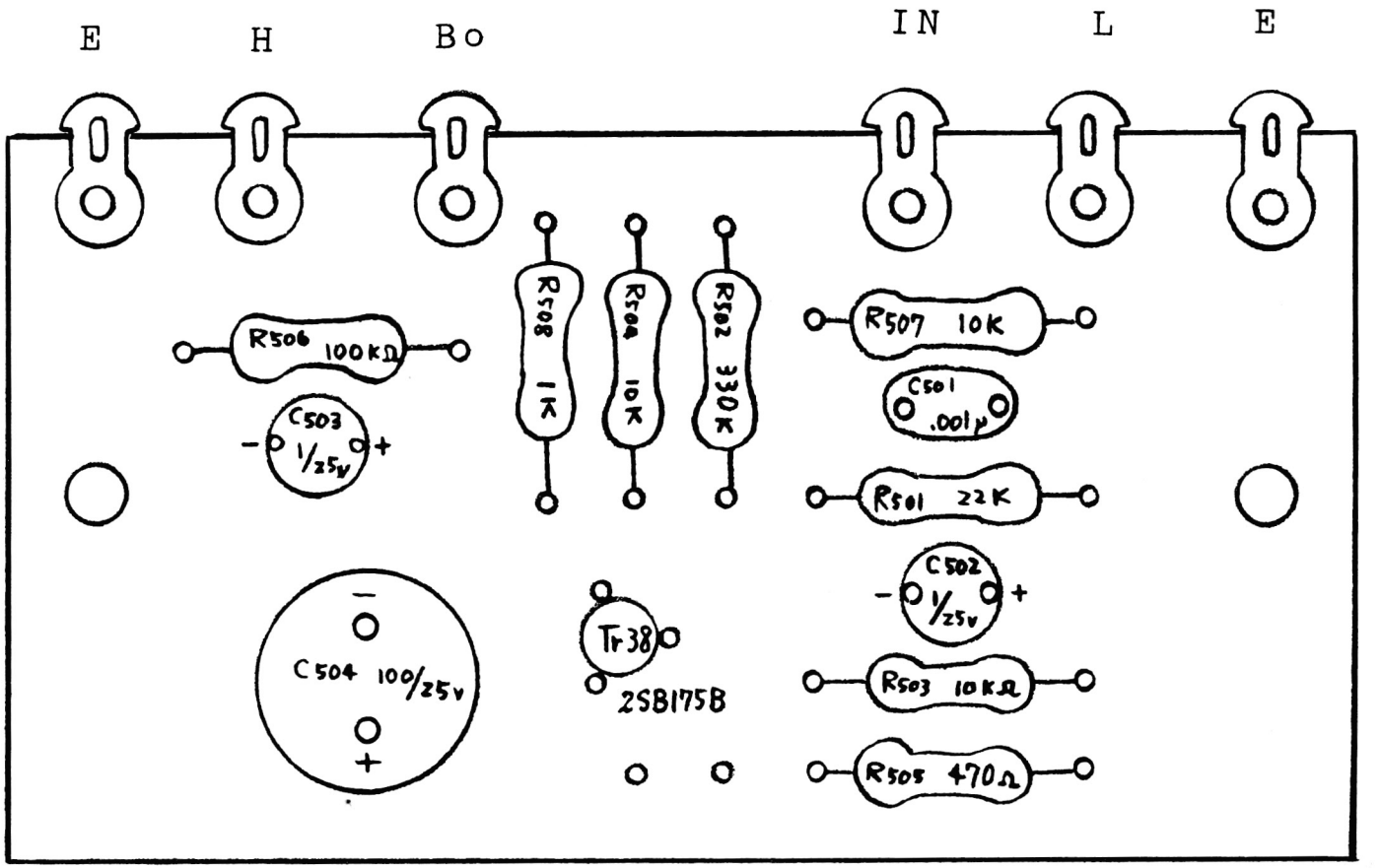

Time →
Rhythm
Instrument
Code
1 2 3 4 1 2 3 4
Waltz
Cy
M
Sd
Bd
1
35'
35
1
Dixieland
B
Bd Sd'
Sd
Bd
34
33
3
3
Western
C+Hb
Hc
Lc' Bd'
31'
32
1
Rock'n Roll
Cy'
Sd
Bd'
Bd
5
25+30
3
1
Slow Rock
Cy'
Sd
Bd
2+9+32
31
1
Bossanova
Cy
Cy'
Cb+Hb
Lc' Bd'
25
5
17
30
2
Fox Trot
Cy
Bd' Sd'
Sd
M
Bd
25
33
25
2
3
Swing
M
Cy
Ed' Sd'
Sd
Bd
8+25
2
33
8+25
3
Tango
M
Cy
Sd
Sd'
Bd
2
27
27
3
3
Beguine
M
C
Lb
Cy
Lc
Lc' Bd'
20
24
18
21
21
16
Rhumba
M
C
Hb
Hc
Lc
Bd
20
24
19
11
15
2
Samba
M
Hc
Lc
Bd
5
1+15
14
2
Mambo
M
Cb
Hb
Lc
Bd
5
3
12+14
15
11
Cha-Cha
M
Cb
Hb
Lc
Bd
5
3+10
7
15
11
Shuffle
Sd
Sd'
Cy
Bd
9+8
3
3
3
March
Sd
Cy
Bd
25+28
2
2

Fig 10



RHVTHM ACE FR-2L

Fig 11 AUDIO PREAMPLIFIER Elements Location Dia.

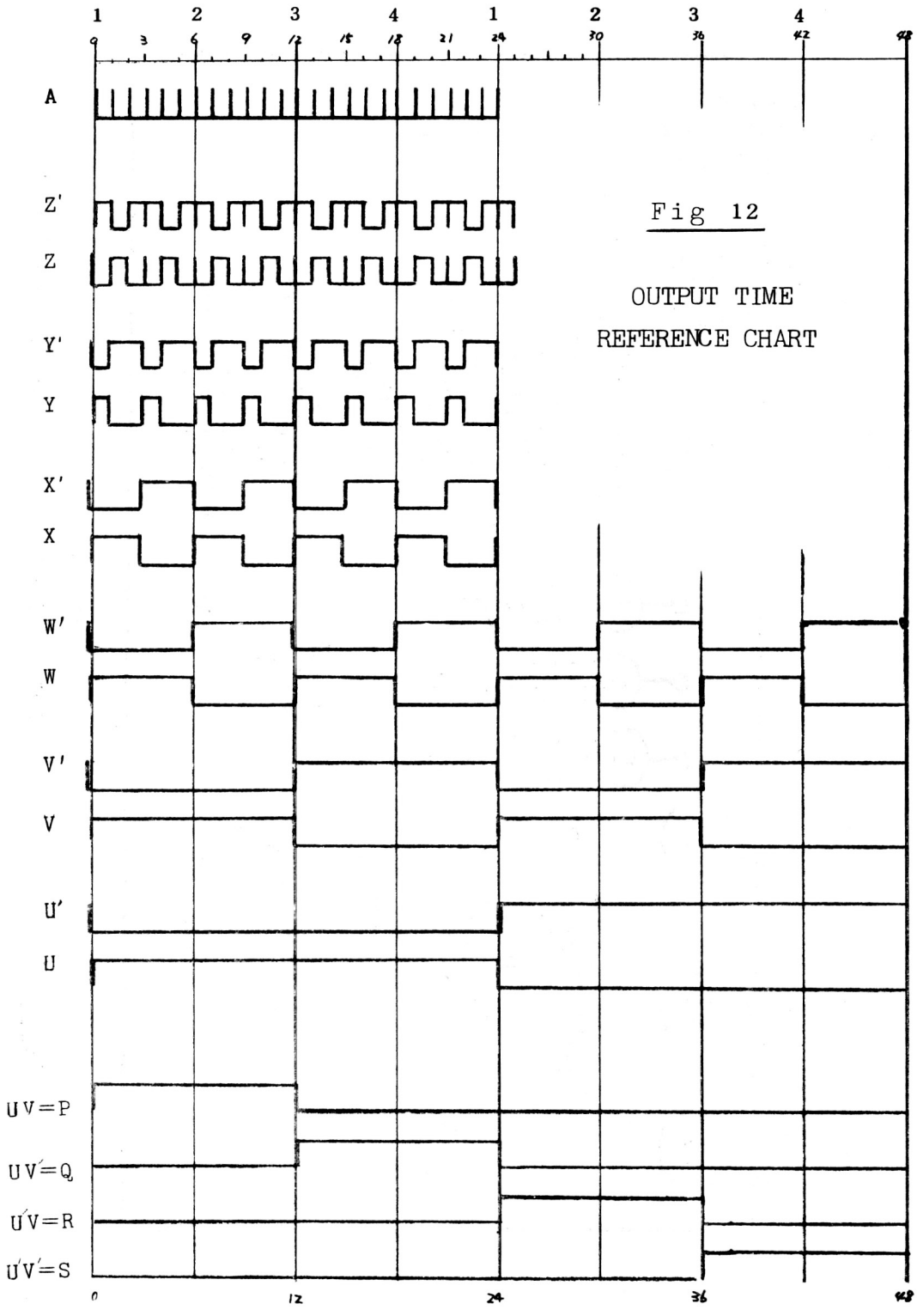


Fig 12

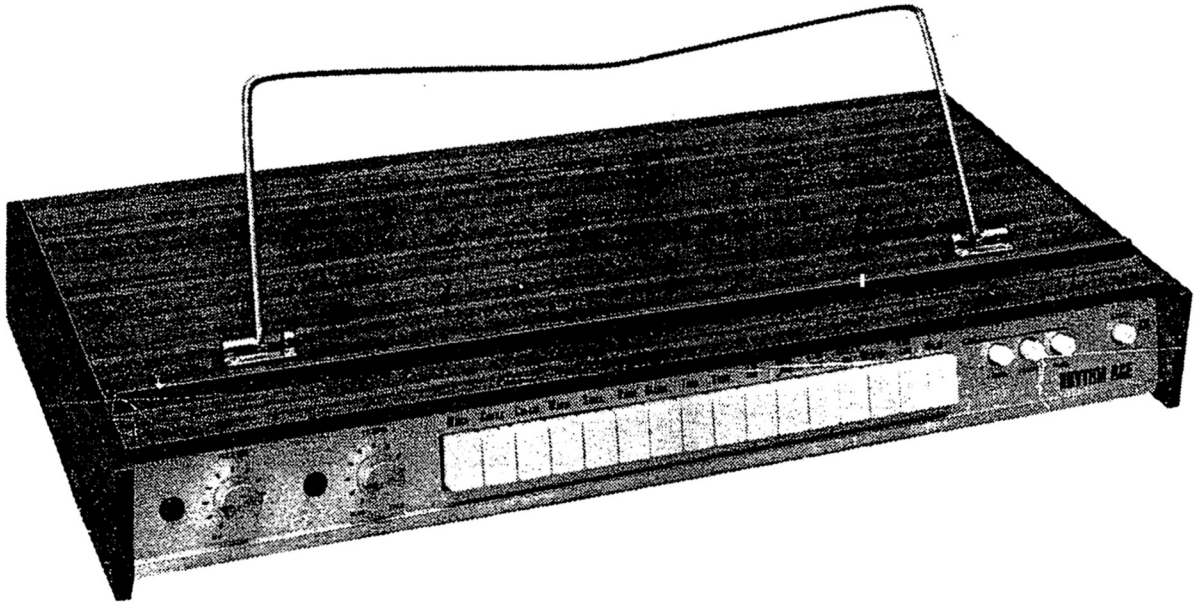
OUTPUT TIME REFERENCE CHART

ACE TONE

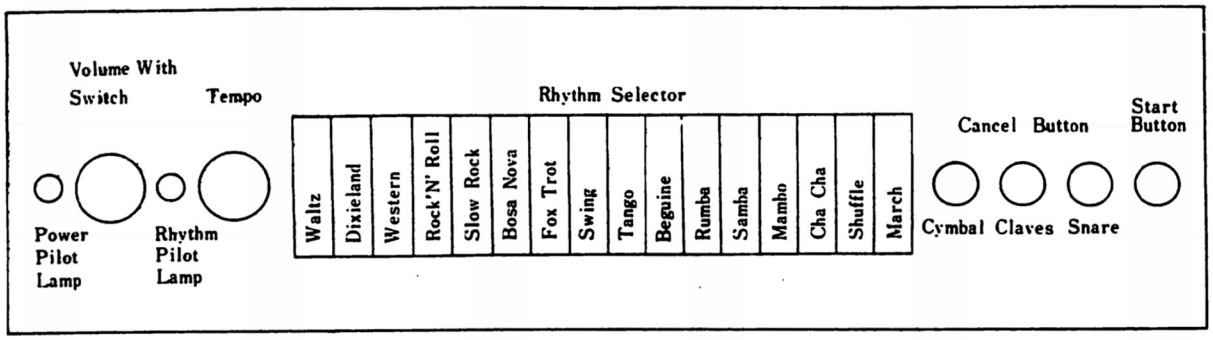
RHYTHM ACE

Full Auto

model FR-2L



FRONT PANEL LAYOUT



SPECIAL FEATURES

1) Troublefree

It is an established and well known fact that Electronic Organs produce sound through electronic device. Likewise, electronic rhythm instruments have been developed on the same principle. Hitherto, percussive sounds were produced mechanically through usage of rotary disc, etc. and since the operation was dependent almost entirely on its mechanical make-up, defects caused by mechanical malfunction was by far the biggest drawback. To over-come such drawbacks, our revolutionary "RHYTHM ACE" Full Auto has been developed on new principles.....a nonmechanical solid state electronic brain incorporating modern precision manufactured transistors.

2) Always start from the first beat.

Rhythm will always start from the first beat. Start, stop and re-start operations can be done with ease through the use of a footswitch.

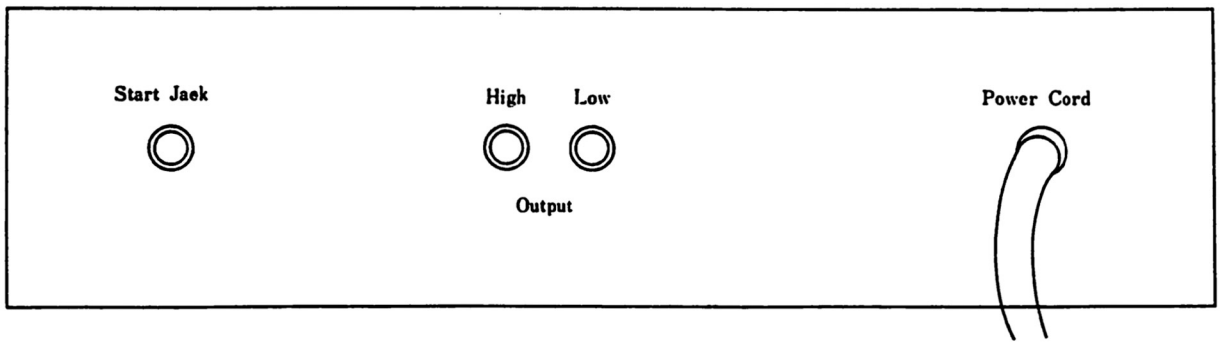
3) Unlimited Rhythm Variations

Mixing two or more rhythms arithmatically at a time will produce interesting variations of rhythms. Three cancel buttons enabling cancellations of Cymbal, Claves, and Snare Drum will give added rhythm varieties.

PREPARATIONS

1. Insert the power cord into the power outlet.
2. For connection to an amplifier, insert one end of the output cord into the output jack "low", and the other end into the amplifier input jack. If the amplifier is not including pre-amplifier or being low inpedance, insert the output cord into the output jack "high"

BACK PANEL LAYOUT



3. Connect the footswitch plug to the start jack on the rear panel.
4. Clock-wise turning of the volume knob located on the left hand corner of the front panel will turn-on power and further movement in the same direction will increase volume

of sound. For reproduction of rhythms, press the start button located on the right hand corner of the panel and then press any of the 16 rhythm selector buttons. Adjust tone level of Model FR-2L and the amplifier to which it is connected for balanced tonal effects.

SPEED ADJUSTMENTS

5. Clock-wise turning of the Tempo knob will increase tempo speed. The pilot lamp will light-up on the first beat but only for Slow-Rock rhythms, light will come on the first and third beats.

START BUTTON AND FOOTSWITCH

6. Rhythms will always start from the first beat when you press the start button. If your hands are occupied in playing the piano or any other instruments, use the footswitch in place of the start button but be sure to release the start button to its original position. To stop the rhythm, either release the start button to its original position or press the footswitch again.

CANCEL BUTTONS

7. If any of the three sounds in the rhythm namely, Cymbal, Claves and Snare Drum is not wanted, press the cancel button corresponding to the sound that needs cancellation.

RHYTHM COMBINATIONS

Mixing two(2)or more rhythms simultaneously will produce interesting rhythm combinations.

For example:

Tango + Mambo =

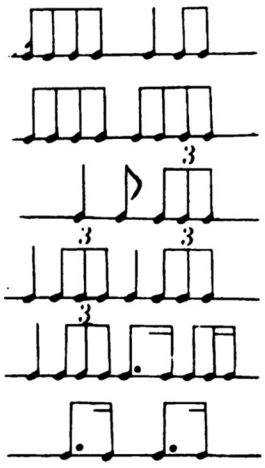
Tango + Rock'n'Roll =

Slow Rock + Shuffle =

Swing + Western =

Swing + Tango+Waltz =

Shuffle + Swing + Dixieland =



Rock'n'Roll and Bosa Nova, or Rock'n'Roll and Rumba will be interesting.

PRECAUTION

1) Avoid playing near fluorescent lights, neon lights, transformers etc, as such will have the effect creating undesirable noise.

2) The Model FR-2L Rhythm Ace has been designed to withstand heavy punishment and is absolutely free from sound distortion but should be played within the capacity rating of the amplifier. It is always advisable to connect to amplifiers having big output power as this will give you a comfortable percentage of allowance.

3) Since it covers a very wide range of tones, the quality of tones may vary according to the types of amplifiers used. Use any amplifiers having high selective qualities.

SPECIFICATIONS

Rhythm Selector	16
Percussive Sound	10
Cancel Button	3
Volume with Switch	1
Speed Control	1
Power Pilot Lamp	1
Speed Pilot Lamp	1
Start Button	1
Output Jack Low	1
High	1
Start Jack	1
Transistor	38
Diode	107

Measurement .....300×600×83mm

Weight ..... 6 kg

Accessories :

Connecting Cord.....1

Footswitch 1

ACE ELECTRONIC IND. INC., JAPAN.